



GK101

10MHz 任意波形发生器

一、产品简介

GK101 10MHz掌上任意波形发生器基于多项先进技术，在较小的体积上实现了普通台式仪器才具有的功能。仪器仅手掌大小，实现了80M采样率、10MHz最大频率、10Vpp最高幅度的输出。

仪器具有全功能的任意波管理、输出功能。任意波数据采用文件系统管理，协议对用户开放，通过虚拟U盘技术，用户可以方便的管理多个任意波文件。

仪器采用高分辨率3寸真彩液晶显示器，并配有电阻触摸屏。配合极具有表达力的中文界面，使用户能快速上手使用，完美表达波形参数。

仪器具有固件升级功能，银杏科技将根据用户反馈逐渐升级、完善仪器固件。

网络直销平台: <http://iCore.taobao.com>
技术支持论坛: <http://www.eeschool.org>
技术支持邮箱: gingko@vip.163.com
技术支持电话: 0379-69926786 69926675



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二、技术指标

波形特性	标准波形	正弦波，方波，三角波，升锯齿，降锯齿，SINC，噪声，升指数，降指数，正全波，负全波，正半波，负半波，高斯函数，直流
	采样率	80M S/s
	垂直分辨率	14Bit
	任意波点数	2~32K
频率特性	内置存储	128M
	输出范围	正弦波: 1mHz~10MHz 方波: 1mHz~10MHz 其他: 1mHz~1MHz
	分辨率	1mHz
	精度	50ppm
电压特性	输出范围	10mVpp~10Vpp
	分辨率	12Bit
	准确度	设定值 8%
	偏置范围	±5V
方波特性	幅度平坦度	优于 0.3dB
	方波占空比	1mHz~1MHz: 0.1%~99.9% 1MHz~10MHz: 固定 50%
	上升/下降沿	< 20ns
	过冲	< 5%
其他特性	输出阻抗	50 欧姆
	斜波对称度	0.1%~99.9%
	同步信号	4.8V~5.2V, TTL 电平
	电源需求	直流 4.75V~5.25V, < 400mA
	显示特性	3 寸, 240x400 分辨率
	尺寸 (长宽高)	116mmx76mmx26mm
	重量	180g

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三、接口说明



- ①: Sync: 同步输出。输出通道选择标准波形时，同步输出端口会输出一个与标准波形同频、同相的TTL波形（低电平0V、高电平5V）。可以通过此端口与数字系统连接，作为数字系统的时钟或触发信号。
- ②: Output: 波形输出端口。本端口为仪器的主输出端口，可以输出标准波形/任意波形。具有50欧姆输出阻抗。使用时请不要将高压输入到此端口。
- ③: USB接口。接口形式为micro usb的标准USB接口。它有两个功能：一是为仪器供电（5V电压）；二是可以与计算机通信。我们也可以通过此接口升级固件。
- ④: 扩展接口。包含UART、触发输入/输出的端口，此端口功能请参考专门文档。

四、物品清单



micro usb线缆



Q9信号输出线缆



5V电源适配器

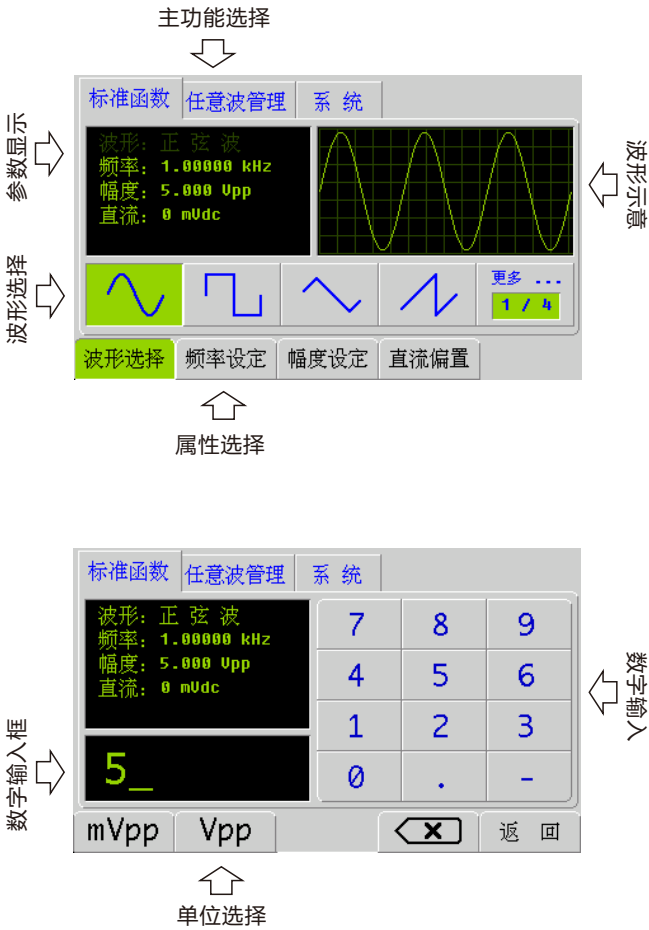


触控笔

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五、基本操作

- ①连接电源：
通过附件 micro usb 线缆，直接连接计算机USB接口完成仪器供电。或者连接附带的5V电源适配器亦可对仪器供电。由于 micro usb 接口尺寸小，插拔时请不要太用力，不要上下、左右晃动，接头突起点朝上，水平稍用力插拔即可。
- ②输出波形：
通过附件触摸笔（或者手指指甲）触控界面，完成波形选择、参数设定。设定后可通过附送Q9线缆（或示波器探头）连接示波器，观看波形。
注：电阻屏需要有压感才能有效。

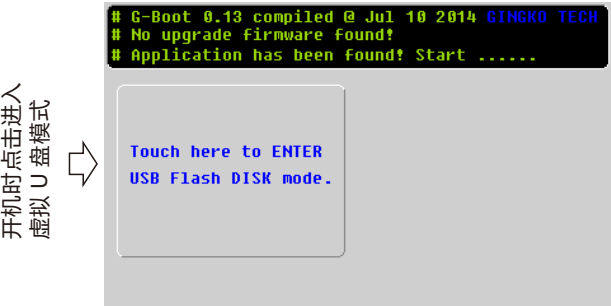


六、虚拟U盘功能

仪器所有的参数、数据文件均以文件形式存储在内置的 128M 存储器内。为了方便管理，仪器内置了虚拟U盘功能。顾名思义，虚拟U盘即是把仪器虚拟成一个U盘。接入计算机后，可以发现多了一个盘符（容量128M）。
虚拟U盘根目录包含两个文件夹，分别为：

- <system> 系统文件夹
- <arb_wave> 任意波文件夹

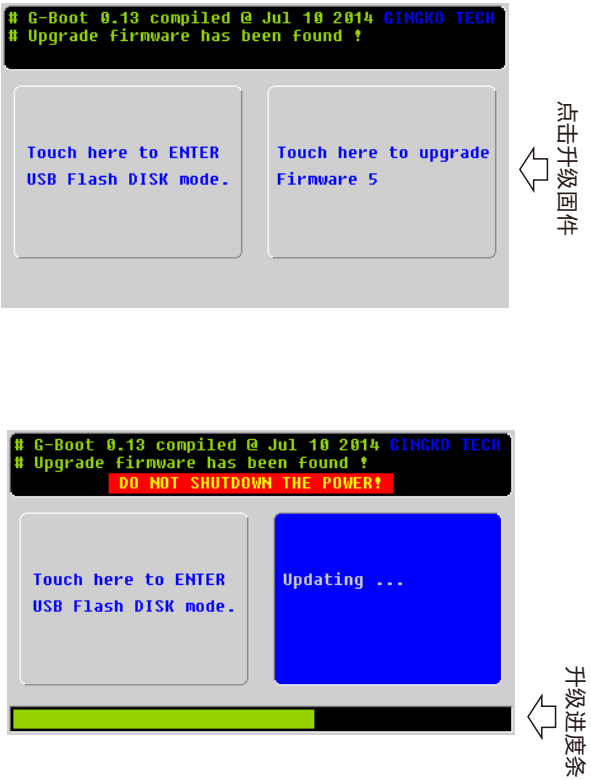
系统文件夹为系统运行所必须的文件集合，包括配置文件、仪器校准数据、标准波形文件及参数存储等。请不要动此文件夹内的文件，否则会导致系统无法正常启动。
任意波文件夹为存储用户任意波文件的集合，连接计算机后，用户可以对此文件夹内的文件进行删除、建立等操作。具体任意波生成方法，请参考专用文档。
开机时点击提示按钮进入虚拟U盘模式，再次点击退出虚拟U盘模式。运行过程中不能进入此模式。



七、升级固件

为了逐步增加功能、修复bug，仪器提供了自行升级固件的功能。用户可以通过虚拟U盘模式升级固件。
升级固件的步骤如下：
①去官方论坛下载固件，名字为：update. bin；
②把仪器连接到计算机；进入虚拟U盘模式；
③不要对文件做任何改动，直接拷贝到U盘的根目录；
④退出虚拟U盘模式，这时仪器会自动检测到升级文件；

- ⑤点击升级按钮（右侧按钮），仪器进行升级。升级固件的时候千万不要断电、不要对仪器进行任何操作，不然可能导致升级失败。升级成功后，仪器会自行使用新固件启动。
⑥为了确认固件是否升级成功，也可以查看系统功能下<关于>菜单下的仪器版本信息。



八、保修政策

仪器免费保修一年，一年后成本维修。保修、维修所带来的运输费用，公司与客户各承担一半。下列情况不在免费保修范围之内：
①液晶为易损件，使用、携带时请大家轻拿轻放，注意包装。液晶损坏不在保修范围内。
②人为损坏，不在保修范围之内。
③不正当操作导致损坏（如输入高压、进水等），不在保修范围之内。



GK101 10MHz Arbitrary Waveform Generator



1. Product Information

GK101 10MHz Arbitrary Waveform Generator based on a number of advanced technology, achieves functions that common instrument has in a small volume. The palm-sized instrument achieves 80M sampling rate, 10MHz maximum frequency, 10Vpp highest amplitude.

The instrument has a full-featured management of arbitrary waveform output function. Arbitrary waveform data use file system management, the protocol is open to users. Users can easily manage multiple arbitrary waveform files through virtual U disk technology.

The instrument uses a high-resolution 3-inch color LCD with a resistive touch screen. With very expressive English language interface, users can quickly use it to express waveform parameters perfectly.

The instrument has a firmware upgrade function. GINGKO will gradually upgrade the instrument firmware based on user feedback.

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Technology BBS: <http://www.eeschool.org>
E-mail : gingko@vip.163.com
Contact us : 0379-69926786 69926675

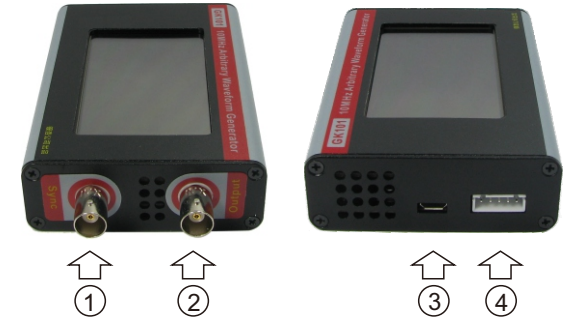


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2. Technical Indicators

Waveform Characteristics	Standard Waveforms	Sine, SINC, DC, Square, Noise, Gaussian, Triangle, Exponential rise, Negative half-wave, Sawtooth rise, Exponential fall, Positive half-wave, Sawtooth fall, Positive full-wave, Negative full-wave
	Sample Rate	80M S/s
	Vertical Resolution	14Bit
	Arbitrary Waveform Length	2 ~ 32K points
	Built-in Storage	128M
Frequency Characteristics	Output Range	Sine: 1mHz ~ 10MHz Square: 1mHz ~ 10MHz Others: 1mHz ~ 1MHz
	Resolution	1mHz
	Accuracy	50ppm
Voltage Characteristics	Output Range	10mVpp~10Vpp
	Resolution	12Bit
	Accuracy	8% of setpoint
	Offset Range	±5V
Square Characteristics	Amplitude Flatness	≥0.3dB
	Duty Cycle	1mHz~1MHz: 0.1%~99.9% 1MHz~10MHz: lock 50%
	Rise / Fall Time	< 20ns
	Overshoot	< 5%
General	Output Impedance	50 Ω
	Ramp Symmetry	0.1%~99.9%
	Sync Signal	4.8V~5.2V, TTL level
	Power Requirements	DC 4.75V ~ 5.25V, <400mA
	Display Characteristics	3-inch, 240x400 resolution
	Dimensions (L*W*H)	116mmx76mmx26mm
	Weight	180g

3. Interface Description



① Sync: Sync Output.

When the output channel is selected to export standard waveform, the synchronous output port will output TTL waveforms (Low 0V, High 5V) which has the same frequency and phase with the standard waveform. Connected with a digital system, this port can be used as clock or trigger signal of the system.

② Output: Waveform Output.

The port is the main output port of the instrument, which can export standard waveforms / arbitrary waveforms. It has a 50 Ω output impedance. Do not input high-voltage into this port.

③ USB Interface.

This is a standard micro usb interface. The functions are as follows: One is to supply power (5V voltage) for the instrument; Another is to communicate with the computer. For more, we can also upgrade the firmware via this interface.

④ Extended Interface.

Contains UART, trigger I/O ports, for more details about the interface features, please refer to the specialized documentation.

4. The Attachments



Micro_usb_cable



Q9 output cable



5V power adapter



Stylus

5. Basic Operation

① Connect to the power

There are two ways of power supply:

One is connected to the computer's USB port via micro_usb_ cable .

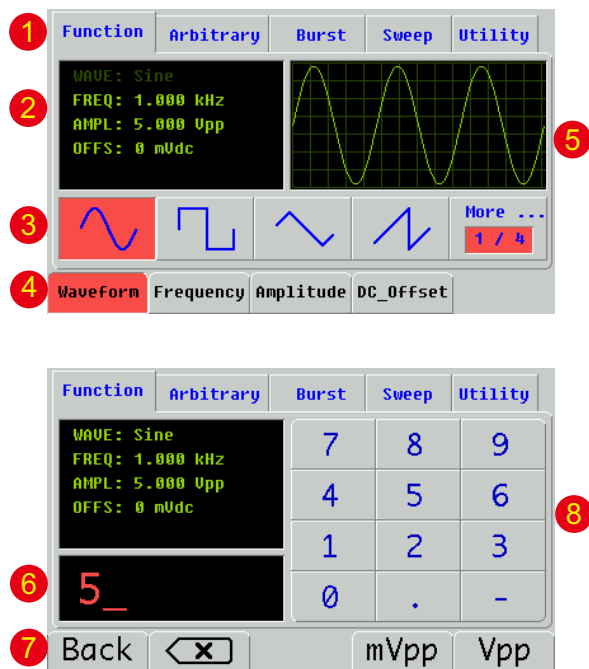
The other is connected to the power via the 5V power adapter .

Considering the small size of the micro_usb_ interface, please be gentle , do not shake around violently when plug.

② Export waveform

Touch the interface with stylus (or your finger nails) to complete the waveform selection, parameter setting and other operations . You can observe the output waveform by connecting the Q9_output_cable (or the oscilloscope probe) with the oscilloscope.

Note: The pressure is necessary for a resistive screen.



- | | |
|----------------------------|----------------------|
| 1. Main function selection | 5. Waveform preview |
| 2. Parameter display | 6. Digital input box |
| 3. Waveform selection | 7. Unit setting |
| 4. Attribute switch | 8. Keyboard |

6. Virtual U Disk Function

All instrument parameters, data files are stored as files in the built-in _128M_ memory. In order to facilitate the management, virtual U-disk function is built-in. As the name suggests, the function makes the instrument as a virtual U-disk. You can find a new disk (capacity 128M), after connected with the computer. Virtual U root directory contains two folders:

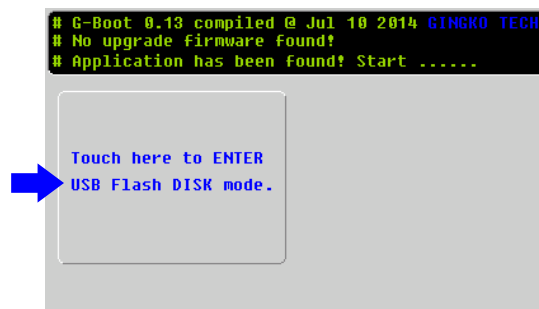
<system> System Folder

<arb_wave> Arbitrary Waveform Folder

System folder consists of configuration files, instrument calibration data, standard waveform files, parameter storage and other necessary files for system operation. Do not do any modifications to the files within this folder, otherwise the system can not boot properly.

Arbitrary waveform folder is the storage of user's arbitrary waveform files. After the instrument is connected to a computer, users can delete or establish a file inside this folder and do any other operations. For more about arbitrary waveform generation method, please refer to the specific documentation.

Click the button to enter the virtual U disk mode when the system roots, click again to exit the virtual U disk mode. Users cannot enter this mode in the process of system running .



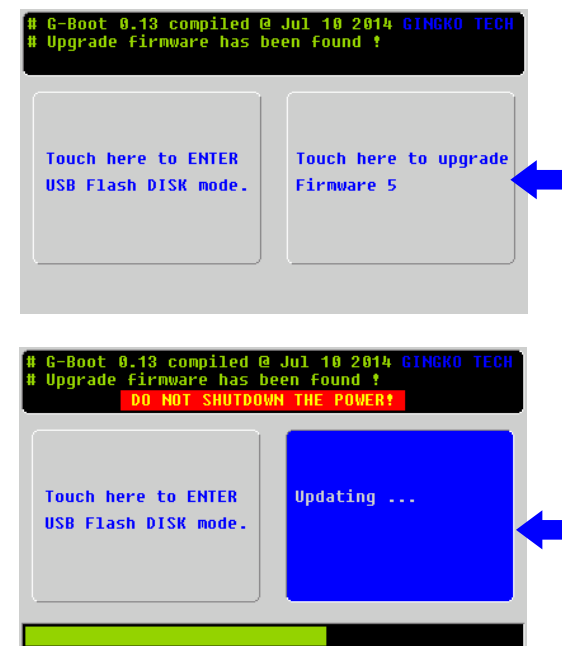
In order to gradually improve the functions of the instrument and fix bugs, the instrument provides firmware upgrade capabilities . Users can upgrade the firmware via the virtual U disk mode. Steps to upgrade the firmware are as follows:

- ① Visit the official BBS to download the file named "update.bin";
- ② Connected the instrument to the computer; Enter the virtual U disk mode;
- ③ Copy the file to the root directory of the U disk without any modifications;

④ Exit the virtual U disk mode, then the instrument will automatically detect the upgrade file;

⑤ Click the upgrade button to upgrade the instrument. Ensure that the instrument will not power off and no operations are performing when upgrading, otherwise the upgrade may fail . After upgrading successfully, the instrument will using the new firmware automatically;

⑥ In order to inspect whether the upgrade is successful, you can view <About> menu to check the instrument version informations .



The instrument warranty period is one year , one year later ,the price of maintenance depends on the cost. Transportation costs caused by warranty and maintenance will be paid by us and the customer in half. The following conditions are not within the scope of warranty:

- ① LCD damage .The liquid crystal is wearing parts, please be gentle when using and carrying .
- ② Man-made damage.
- ③ Improper operation damage (such as high-voltage inputs, water , etc.).